



# **TENNESSEE BUREAU OF INVESTIGATION**

## *Forensic Services Division*

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### Breath Alcohol Unit Standard Operating Procedures Manual Software/Firmware Testing

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## **2. SOFTWARE/FIRMWARE TESTING – INSTRUMENT ACCEPTANCE**

### 2.1. Initial Instructions

#### A. Initial instructions for Software/Firmware Testing

1. This testing will be performed on a new firmware/software version on a training instrument prior to installation in instruments already deployed for evidential (field) use.
2. Upload new software/firmware version after ensuring that the instrument has been downloaded, if applicable.
3. Print Software and Firmware Versions.
4. Adjust the Instrument (Section: 3).
5. Perform Instrument Calibration (Section: 4)
6. Proceed to 2.2.

#### B. Initial instructions for Instrument Acceptance

1. This testing will be performed on every new instrument prior to evidential (field) use.
2. Upload the approved software/firmware version.
3. Print Software and Firmware Versions.
4. Adjust the Instrument (Section: 3).
5. Perform Instrument Calibration (Section: 4)

### 2.2. Additional Instructions



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- A. Retain and initial all printouts.
- B. Different types of instrument testing must be carried out to ensure that tests are accurate and proper.
  - 1. An evidential/subject test is a test that is used by certified operators to test motorists, pedestrians, or any other person under the influence of alcohol. Tests will be carried out to verify:
    - Data entry
    - Countdown timer
    - Testing procedure
    - Printout
  - 2. A calibration test is a test used by the TBI Forensic Scientist to make an adjustment to the instrument's alcohol measuring device. Tests will be carried out to verify:
    - Password protection
    - Data entry
    - Testing procedure
    - Printout
  - 3. An accuracy test is used by the TBI Forensic Scientist to test the instrument's accuracy and precision. Tests will be carried out to verify:
    - Password protection
    - Data entry
    - Testing procedure
    - Printout
  - 4. A training test is a test used by the TBI Forensic Scientist that is identical to an evidential/subject test with the exception of a shorter observation countdown timer. Tests will be carried out to verify:
    - Password protection
    - Data entry
    - Observation timer
    - Testing procedure



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➤ Printout

5. A quick test (when available) is a test used by TBI Forensic Scientists and Certified Operators to test someone's alcohol level for purposed other than evidence. Tests will be carried out to verify:

- Password protection
- Data entry
- Testing procedure
- Printout

- C. Testing will be carried out to ensure the sampling system is measuring alcohol accurately and that the proper results are displayed when applicable.
- D. For any portion of this procedure that does not fall within expected/acceptable results or messages, due to undeterminable reasons, testing will be stopped. The Technical Leader will then be consulted. Testing may be resumed at the direction of the Technical Leader. The Technical Leader will ensure that proper documentation will be generated and maintained.

#### 2.3. Linearity

- A. Run an accuracy check (2 samples) with a 0.020 dry gas standard.
- B. Run an accuracy check (2 samples) with a 0.050 dry gas standard.
- C. Run an accuracy check (2 samples) with a 0.080 dry gas standard.
- D. Run an accuracy check (2 samples) with a 0.100 dry gas standard.
- E. Run an accuracy check (2 samples) with a 0.200 dry gas standard.
- F. Run an accuracy check (2 samples) with a 0.082 dry gas standard.
- G. Expected results for each of the above listed solutions:



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1. For accuracy, all samples must be within 5% or .005g/210L of the target, whichever is greater.
2. For precision, the two samples must be within 0.003g/210L of each other.

H. Run a blank air sample while running an evidential test. When prompted for a subject last name type in: TBI.

When prompted for a subject first name type in: Blank.

When prompted for operator last and first name type in your complete name.

#### 2.4. Record of Data

- A. Record all of your data on an Instrument Certification Sheet (see appendix).
- B. The Certification sheet will be retained in a folder specific for each instrument.
- C. All paperwork is to be retained in the instrument's folder. Each instrument's folder will reside at the TBI Crime Laboratory where the certifying Breath Alcohol Scientist is stationed.

#### 2.5. Use

**No instrument shall be used as an evidential instrument prior to meeting all of the above listed criteria. If an instrument fails the testing criteria it will be recalibrated and retested. If it fails again it**



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**will be returned to the manufacturer for repair. When it is returned to TBI from the manufacturer, the initial testing of that instrument will be repeated.**

**No firmware/software shall be used on an evidential instrument for breath testing (field use) prior to meeting all of the above listed criteria.**